

§103 Rejection of the Claims

Claims 1-7 and 10-12 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Benzinger et al. (U.S. 3,617,613) in view of Beck (U.S. 2,695,351). Applicant traverses the rejections of claims 1-7 and 10-12.

Claim 1 recites, "a surface layer having a surface layer thickness that is between about 10% and about 30% of the circuit board thickness, the surface layer being free of fibers." In contrast, Benzinger et al. teach what appears to be a surface layer (labeled with reference numeral 7) in Fig. 2. However, the specification fails to list elements having a reference numeral 7. Hence, the specification fails to teach or suggest a thickness for the surface layer assigned the reference numeral 7. Beck appears to show a surface layer 11 in Fig. 13. However, the specification fails to attribute a thickness of the surface layer 11. Hence, the specification fails to teach or suggest a thickness for the surface layer 11. Thus, neither Benzinger et al. nor Beck, either alone or in combination, teach or suggest each of the elements of claim 1. Therefore, the office action fails to state a *prima facie* case of obviousness with respect to claim 1.

Claims 2 and 3 are dependent on claim 1. For reasons analogous to those stated above, applicant respectfully submits that the office action fails to state a *prima facie* case of obviousness with respect to claims 2 and 3.

Claim 4 recites, "a surface resin layer having a surface layer thickness that is between about 10% and about 30% of the circuit board thickness." For reasons analogous to those stated above in the discussion of claim 1, applicant respectfully submits that the office action fails to state a *prima facie* case of obviousness with respect to claim 4.

Claim 5 recites, "wherein the core layer is a polymeric composite material." In contrast, Benzinger et al. teach, "any electrically insulating thermosetting resin in addition to epoxy type resins may be used to impregnate the nonwoven core-woven facing sheet composite." Hence Benzinger et al. fail to teach or suggest a core layer that is a "polymeric composite material." Beck also fails to teach or suggest a core layer that is a "polymeric composite material." Beck teaches at column 4, lines 21-26, "The sheet 60 is attached to the underlying layer of plastic 10 by means of the adhesive resin layer 58, the two sheets 60 and 10 being pressed together under light pressure and moderately heated until the plastic 58 is only partially cured." Hence, neither

Benzinger et al. nor Beck, either alone or in combination, teach or suggest each of the elements of claim 5. Thus, the office action fails to state a *prima facie* case of obviousness with respect to claim 5.

Claim 6 recites, "wherein the core layer has a thickness of between about .006 and about .012 inches. The references fail to teach or suggest a thickness for the core layer. The office action states, "The specific thickness of the core layer would have [been] an obvious design consideration based on the amount of reinforcement necessary for the printed circuit board." Applicant assumes that the Examiner is taking official notice of the missing elements from an undisclosed source. Applicant respectfully objects to the taking of official notice, and pursuant to M.P.E.P. § 2144.03, applicant traverses the assertion of official notice and requests that the Examiner cite a reference that teaches the missing element. If the Examiner cannot cite a reference that teaches the missing element, applicant respectfully requests that the Examiner provide an affidavit describing how the missing elements are present in the prior art. If the examiner cannot cite a reference or provide an affidavit, applicant requests withdrawal of the rejection and reconsideration and allowance of claim 6.

Furthermore, claims 5 and 6 are dependent on claim 4. For reasons analogous to those stated above in the discussion of claim 4, applicant respectfully submits that the office action fails to state a *prima facie* case of obviousness with respect to claims 5 and 6.

Claims 7 and 10 recite, "a first layer having a first layer thickness that is between about 10% to 15% of the circuit board thickness." The office action relies on Benzinger et al. to establish disclosure of "a circuit board having first and second resin layers (5, 7), each of which having a thickness of between 10 and 15 percent of the board thickness (see figure 1)." Applicant respectfully disagrees that Benzinger et al. teach the recited element. Benzinger et al. fail to provide a description in the specification of the element labeled with reference numeral 7 in Fig. 1. Thus, Benzinger et al. fails to teach or suggest, "a first layer having a first layer thickness that is between about 10% to 15 % of the circuit board thickness." Hence, the references fail to teach or suggest each of the elements of claims 7 and 10. Thus, the office action fails to state a *prima facie* case of obviousness with respect to claims 7 and 10.

Claims 11 and 12 are dependent on claim 10. For reasons analogous to those stated above, applicant respectfully submits that the office action fails to state a *prima facie* case of obviousness with respect to claims 11 and 12.

Even if the references teach or suggest each of the elements of claims 1-7 and 10-12, the office action must provide specific, objective evidence of record for a finding of a suggestion or motivation to combine reference teachings and must explain the reasoning by which the evidence is deemed to support such a finding to establish a *prima facie* case of obviousness. *In re Sang Su Lee*, 277 F.3d 1338, 61 U.S.P.Q.2d 1430 (Fed. Cir. 2002). The office action states, "It would have been obvious to a person having ordinary skill in the art at the time invention was made to use the non fiber material for the surface layer of Benzinger et al., as suggested by Beck, for the purpose of facilitating application of circuit traces on the board." The office action also states, "It would have been obvious to a person having ordinary skill in the art at the time invention was made to use the non fiber material for the surface layer of Benzinger et al., as suggested by Beck, for the purpose of facilitating application of circuit traces on the board. Finally, the office action states, "It would have been obvious to a person having ordinary skill in the art at the time invention was made to use multiple non-fibrous materials for the first and second layers to improve the insulative quality of the surface of the printed circuit board." The office action fails to connect these conclusory statements to the record. Hence, the office action fails to meet the standard for finding a suggestion or motivation to combine references enunciated in *In re Sang Su Lee*. Thus, the office action fails to state a *prima facie* case of obviousness with respect to claims 1-7 and 10-12.

Therefore, applicant requests withdrawal of the rejections and reconsideration and allowance of claims 1-7 and 10-12.

Claims 8 and 9 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Benzinger et al., as modified, as applied to claim 7 above, and further in view of Carroll et al. (U.S. 4,886,699). Applicant traverses the rejections of claims 8 and 9.

Claim 8 recites, " wherein the core layer has greater mechanical strength [that] than the first layer." Claim 9 recites, "wherein the core layer has greater mechanical strength [that] than the second layer." (Applicant has amended claims 8 and 9 to correct the typographical error.)

The office action cites to Carroll et al. at column 3, lines 55-65 to establish disclosure of the recited elements. Carroll et al. at column 3, lines 55-65 recites:

Preferably, the fluoropolymer impregnated woven glass cloth layer (e.g. layer 18) will consist of a suitable commercially available weave of E-glass with weight percent of fluoropolymer of between about 30% to about 85%. These weaves may include, in addition to style 1080, styles 108, 106, 112 and similar styles. All of the style numbers are common industry designations.

The cited text fails to teach or suggest an element "wherein the core layer has greater mechanical strength [that] than the second layer." The cited text fails to describe anything related to the mechanical strength of the core layer. Hence, the reference relied upon to teach or suggest the recited element, fails to teach or suggest the recited element. Thus, the office action fails state a *prima facie* case of obviousness with respect to claims 8 and 9.

Even if the references teach or suggest the elements of a claims 8 and 9, the office action must also provide specific, objective evidence of record for a finding of a suggestion or motivation to combine reference teachings and must explain the reasoning by which the evidence is deemed to support such a finding to establish a *prima facie* case of obviousness. *In re Sang Su Lee*, 277 F.3d 1338, 61 U.S.P.Q.2d 1430 (Fed. Cir. 2002). The office action states, "It would have been obvious to a person having ordinary skill in the art at the time invention was made to use a core having a greater strength than the surrounding layers for the purpose of providing rigidity to the circuit board." The office action fails to connect these conclusory statements to the record. Hence, the office action fails to meet the standard for finding a suggestion or motivation to combine references enunciated in *In re Sang Su Lee*. Thus, the office action fails to state a *prima facie* case of obviousness with respect to claims 8 and 9.

Therefore, applicant requests withdrawal of the rejections and reconsideration and allowance of claims 8 and 9.

Claims 13-18 and 21-25 were rejected under 35 U.S.C. § 103(a) as being unpatentable over the applicant admitted prior art shown in a Figure 1 (AAPA, hereinafter) in view of Benzinger et al. Applicant traverses the rejections of claims 13-18 and 21-25.

Claims 13, 16, and 21 recite, "a number of fibers having a fiber thickness of between about .001 inches and about .002 inches." The office action cites to the abstract of Benzinger et al. to establish this element. The abstract at lines 6 and 7, recites, "the fibers of which have diameters in the range of .2 to 14 microns." A range of .2 to 14 microns is equivalent to a range of .000008 inches to .000551 inches. Thus, the range of diameters disclosed in the reference is outside the range fiber thicknesses recited in claims 13, 16, and 21. Hence, Benzinger et al. fail to teach or suggest each of the elements of claims 13, 16, and 21. Thus, the office action fails to state a *prima facie* case of obviousness with respect to claims 13, 16, and 21.

Claims 14 and 15 are dependent on claim 13. Claims 17 and 18 are dependent on claim 16. Claims 22 and 23 are dependent on claim 21. For reasons analogous to those stated above, applicant respectfully submits that the office action fails to state a *prima facie* case of obviousness with respect to claims 14-15, 17-18, and 22-23.

Claim 24 recites, "a first distance between about 10% and about 15% of the thickness away from a number of fibers." The office action cites to Benzinger et al. to establish this element. The office action at page 6 states, "the surface portion (7) located at a distance between about 10 to 20 percent of the thickness away from the number of fibers." Applicant respectfully disagrees that Benzinger et al. teach the recited element. Benzinger et al. fail to provide a description in the specification of the element labeled with reference numeral 7 in Fig. 1. Thus, Benzinger et al. fails to teach or suggest, "a first distance between about 10% and about 15% of the thickness away from a number of fibers." Hence, the references fail to teach or suggest each of the elements of claim 24. Thus, the office action fails to state a *prima facie* case of obviousness with respect to claim 24.

Claims 25 is dependent on claim 24. For reasons analogous to those stated above, applicant respectfully submits that the office action fails to state a *prima facie* case of obviousness with respect to claim 25.

Even if the references teach or suggest the elements of a claims 13-18 and 21-25, the office action must also provide specific, objective evidence of record for a finding of a suggestion or motivation to combine reference teachings and must explain the reasoning by which the evidence is deemed to support such a finding to establish a *prima facie* case of

obviousness. *In re Sang Su Lee*, 277 F.3d 1338, 61 U.S.P.Q.2d 1430 (Fed. Cir. 2002). The office action states, "It would have been obvious to a person having ordinary skill in the art at the time invention was made to use the circuit board design of Benzinger et al. for the second circuit board of AAPA, for the purpose of facilitating mounting of the die." The office action fails to connect these conclusory statements to the record. Hence, the office action fails to meet the standard for finding a suggestion or motivation to combine references enunciated in *In re Sang Su Lee*. Thus, the office action fails to state a *prima facie* case of obviousness with respect to claims 13-18 and 21-25.

Therefore, applicant requests withdrawal of the rejections and reconsideration and allowance of claims 13-18 and 21-25.

Claims 19-20 were rejected under 35 U.S.C. § 103(a) as being unpatentable over AAPA in view of Benzinger et al. as applied to claim 13 above and further in view of Beck. Applicant traverses the rejections of claims 19-20.

Claim 19 recites, "a surface layer having a surface layer thickness that is between about 10% and about 30% of the circuit board thickness, the surface layer being free of fibers." In contrast, Benzinger et al. teach what appears to be a surface layer (labeled with reference numeral 7) in Fig. 2. However, the specification fails to list elements having a reference numeral 7. Hence, the specification fails to teach or suggest a thickness for the surface layer assigned the reference numeral 7. Beck appears to show a surface layer 11 in Fig. 13. However, the specification fails to attribute a thickness of the surface layer 11. Hence, the specification fails to teach or suggest a thickness for the surface layer 11. Thus, neither Benzinger et al. nor Beck, either alone or in combination, teach or suggest each of the elements of claim 19. Therefore, the office action fails to state a *prima facie* case of obviousness with respect to claim 19.

Claims 20 is dependent on claim 19. For reasons analogous to those stated above, applicant respectfully submits that the office action fails to state a *prima facie* case of obviousness with respect to claim 20.

Even if the references teach or suggest the elements of a claims 19-20, the office action must also provide specific, objective evidence of record for a finding of a suggestion or motivation to combine reference teachings and must explain the reasoning by which the evidence

is deemed to support such a finding to establish a *prima facie* case of obviousness. *In re Sang Su Lee*, 277 F.3d 1338, 61 U.S.P.Q.2d 1430 (Fed. Cir. 2002). The office action states, "It would have been obvious to a person having ordinary skill in the art at the time invention was made to use the non fiber material for the surface layer of AAPA in view of Benzinger et al., as suggested by Beck, for the purpose of facilitating application of circuit traces on the board." The office action fails to connect these conclusory statements to the record. Hence, the office action fails to meet the standard for finding a suggestion or motivation to combine references enunciated in *In re Sang Su Lee*. Thus, the office action fails to state a *prima facie* case of obviousness with respect to claims 19-20.

Therefore, applicant requests withdrawal of the rejections and reconsideration and allowance of claims 19-20.

CONCLUSION

Applicant respectfully submits that the claims are in condition for allowance and notification to that effect is earnestly requested. The Examiner is invited to telephone applicant's attorney at 612-371-2109 to facilitate prosecution of the application.

If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 19-0743.

Respectfully submitted,

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